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ABSTRACT

This paper tested the hypothesis that certain cognitive, affective, and psychomotor variables were significant predictors of college persistence in the first few weeks of the freshman year. Data for the study involved 462 freshmen, with an average age of 18, who matriculated in the fall of 1997 at a public higher education institution; about 93 percent of the participants were male; the ethnic background of the students was 81.5 percent white, 8.4 percent black, 5.4 percent Asian, and 3.3 percent Hispanic. About 32 percent of the participants were engineering majors, 17 percent were science majors, and 47 percent were majoring in liberal arts. Dropouts were classified into three groups and were then compared with persisters in an analysis of variance study. Logistic regression identified self-efficacy and physical fitness as positive predictors of freshman retention, while judgment and empathy were negatively associated with persistence. Three reasons were identified for freshman attrition: inability to handle stress, mismatch between personal expectations and college reality, and lack of personal commitment to a college education. Intervention strategies to prevent early withdrawal are also discussed. Four tables summarize some of the data. (Contains 22 references.) (CH)

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Prediction and Analysis of Freshman Retention

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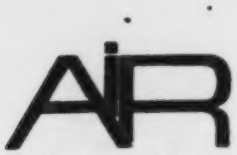

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Dolores Vura
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Abstract

The study represents an innovative approach to predicting and analyzing freshman retention within the context of cognitive, affective, and psychomotor domains. Logistic regression of the data from 462 freshmen enrolled in a public institution suggested that certain cognitive, affective, and psychomotor variables were significant predictors of college persistence in the first few weeks of freshman year. Dropouts were classified into three groups based on their reasons for withdrawal and were then compared with the persisters in a MANOVA design. It was concluded that deficiency in affective and psychomotor measures only characterized some dropouts whereas for others the decision to withdraw from college was an indication of maturity in judging the needs of the individual in relation to external environment. Intervention strategies for early withdrawal were discussed.

Prediction and Analysis of Freshman Retention

The issue of explaining and predicting student attrition has captured much attention in higher education during the past three decades. Typical models of student retention have focused on examining student characteristics in relation to the collegiate environment (Tinto, 1975) and external factors such as financial issues and family support (Bean, 1982). More recently, much of the research in this area reflects an effort to modify or integrate existing models into a paradigm designed to illuminate the underlying causes of college attrition (Cabrera, Nora, & Castaneda, 1993; Guarino, Hocevar, & Baker, 1997). The purpose of the present study is to expand the traditional approach by analyzing college persistence within the context of cognitive, affective, and psychomotor domains. Specifically, the study attempts to (1) identify cognitive, affective, and psychomotor predictors of college persistence in the first few weeks of the freshman year, (2) analyze the causes for early withdrawal, and (3) determine how early dropouts differ from persisters on cognitive, affective, and psychomotor measures.

Literature Review

Among the various models proposed to study college persistence, Tinto's Student Integration Model (1975) and Bean's Student Attrition Model (1982) have provided the most comprehensive framework for the study of early-departure decisions. In his model of student retention, Tinto (1975) proposed that students' precollege characteristics affect their initial levels of commitment to the institution attended and their goal of completing college. This initial commitment, in turn, influences the way students interact with the college environment resulting in varying degrees of academic and social integration as well as different levels of subsequent commitment. The level of commitment and integration has a direct impact on a student's decisions to persist or withdraw from an institution. Tinto's model has generated a line of research through validation, replication, and integration of existing models (Pascarella & Terenzini, 1980, 1983).

Bean developed an alternative model of student attrition based upon the process model of organizational turnover and models of attitude-behavior interaction (1980, 1982, 1983). According to Bean, a student's institutional experience affects his or her beliefs and attitudes which, in turn, influence the decision to continue to enroll or withdraw. Different from Tinto's

theory, Bean's attrition model considers external factors affecting college persistence such as financial stability and level of family support. Another class of research, the so-called convergence studies, suggest that a better understanding of the persistence process can be derived when Bean's constructs of financial attitudes and family support are incorporated into Tinto's model of integration and commitment (Cabrera, Castaneda, Nora, & Hengstler, 1992).

Other constructs have been incorporated into traditional models to achieve a better understanding and more accurate predication rates of college persistence. For example, Guarino, Hocevar, and Baker (1997) integrated the construct of locus of control into Tinto's model when they reported that internals showed higher commitment and were more likely to persist even when burdened by lower academic integration scores. Brown and Kurpius (1997) made similar efforts to examine student attrition when they studied, within Tinto's framework of commitment and integration, the effects of perceived discrimination on college persistence for American Indian students.

The present study represents another attempt to broaden traditional models of college persistence by using qualitative and quantitative techniques to investigate freshman retention within the cognitive, affective, and psychomotor domains.

Methodology

Sample

Four hundred and sixty-two freshmen who matriculated in the fall of 1997 at a public institution participated in the study. About 93% of the participants were male. The distribution of the ethnic background of the students was 81.5% White, 8.4% Black, 5.4 % Asian, and 3.3% Hispanic. In terms of academic concentration, 32.3% of the students majored in engineering, 17% in science, and 47.4% in liberal arts. Fifty-one percent of the students were in-state residents while the remainder came from other states or foreign countries. The average age of the sample was 18. By the end of the third week 430 students (93%) persisted while 32 (7%) dropped out.

Instruments and Variables

As part of student assessment during matriculation, data were collected on several instruments including the College Facilitative Skills Inventory (CFSI) (Zhang & RiCharde, 1997), Scale of Intellectual Development (SID) (Erwin, 1983), Myers Briggs Type Indicator (MBTI),

and a Physical Fitness Test (PFT). Information on precollege variables such as high school GPA (HSGPA) and combined SAT (SAT) was also obtained from the institutional database. Immediately prior to their final departure, the dropouts were asked to complete a questionnaire with open-ended questions concerning their college experience and reasons for withdrawal.

The CFSI is designed to measure college students' academic skills, perseverance, locus of control, self-efficacy, and delayed gratification. During standardization, the analysis of the sample data yielded a Cronbach alpha reliability of .85, suggesting the CFSI has a high degree of internal consistency.

The SID measures four stages of intellectual development: dualism (the tendency to think in black or white terms and look to authority for guidance), relativism (the ability to recognize alternative perspectives, yet lack confidence in one's own beliefs and actions), commitment (the ability to make major decisions about one's life and accept their consequences), and empathy (an awareness of the impact of one's decisions and actions on others, a tendency to demonstrate concern for the broader society). The four stages represent an increasing level of intellectual sophistication (Erwin, 1983). Rooted in the framework of the cognitive-developmental tradition, intellectual development in its many manifestations has been identified as a major goal of college education (Creamer, 1989). Research indicates that as students progress through the undergraduate experience, their intellectual development is marked by a decrease in scores on dualism and relativism as well as a discontinuous increase in scores on commitment and empathy (Zhang & RiCharde, 1998).

The MBTI is a personality inventory with four bipolar indicators: extroversion versus introversion, intuitive versus sensing, thinking versus feeling, and judging versus perceiving. Research suggests that personality type is associated with learning styles (Lawrence, 1993) and career choice (Hammer & Macdaid, 1992). Our data on college students indicate that MBTI scales are moderate predictors of academic performance in a college setting.

The PFT produces three specific measures that indicate college students' physical fitness: sit-up, pull-up, and time in a mile and one half run. A total score is also generated as a global fitness index.

Cognitive variables used in the study were generated from the MBTI and other pre-

collegiate scores: HSGPA, SAT, Thinking, and Judging. Affective variables came from the CFSI and the SID: Perseverance, Self-efficacy, Delayed Gratification, Dualism, Relativism, Commitment, and Empathy. The global Physical Fitness index from the PFT was the only variable in the psychomotor domain.

Data Analysis

Logistic Regression. Logistic regression was used to build a prediction model in which cognitive, affective, and psychomotor variables were included in the analysis to predict retention status for college freshmen. All variables were entered simultaneously and .25 was specified as the backward selection criterion. The overall data-to-model fit was assessed using Pseudo R^2, the G^2/df ratio where G^2 is also called - 2 Log L on the SAS printout, and the chi-square statistic (Teodorescu, 1997). Pseudo R^2 represents the proportion of error variance that an alternative model reduces in relation to a null model. While there are no established procedures to test the statistical significance of the G^2/df ratio, the rule of thumb is that a given model is accepted whenever the G^2/df ratio is less than 2.5. As to the chi-square statistic for overall fit of the model, a significant p value suggests that an alternative model results in a substantial reduction in G^2 in relation to the null model, thus indicating a better data-to-model fit. In addition to assessing goodness of fit of the overall model, independent variables were also examined for their individual contribution in the prediction model. This was accomplished by evaluating the Wald statistic and its corresponding p value for each independent variable.

Content Analysis. Content analysis was performed on the dropouts' responses to the open-ended questions concerning their goals in attending college, degree of satisfaction with college experience, reasons for withdrawal, and plans for their future education. The analysis provided information about the characteristics of the dropouts. Based on their reasons for departure, the dropouts were classified into three groups for subsequent analysis.

One-Way MANOVA. A one-way MANOVA was performed on the data using group as the independent variable and cognitive, affective, and psychomotor measures as the dependent variables. A Wilk's lambda test was used to determine the multivariate effects. Contrast statements were written to facilitate comparisons between persisters and different groups of leavers when multivariate effects were significant. The MANOVA was conducted using SAS.

The purpose of the analysis was to determine whether or not the dropouts differed significantly from the persisters on cognitive, affective, and psychomotor measures.

Results and Discussion

Logistic Regression

The Wald statistic of logistic regression indicated that Judging, Self-Efficacy, Empathy, and Physical Fitness contributed significantly to the regression model ($p < .05$). Since these variables are continuous with a maximum value greater than one, a quarter of the maximum value was used as one unit of change in an independent variable and the odds ratio for corresponding change in the dependent variable was estimated (Hosmer & Lemeshow, 1989). The overall fit of the model was evidenced in a small G^2/df ratio of .41, a significant chi-square value of 29.19 ($p < .001$), and the fact that 29% of the error variance was explained by the full model. These statistics, together with Beta weights, Wald statistics, and odds ratios are reported in Table 1.

Insert Table 1 About Here

Judging reflects an individual's cognitive style in decision-making. Those scoring high on Judging tend to control the world through conscious and planned decision-making rather than dealing flexibly with whatever life brings. In addition, individuals scoring high on Judging focus more on closure than on process. In the context of the present study, the dropouts scored higher than stayers on Judging (Beta = -.08). With an increase of 7 score points on Judging, the risk of leaving college increased 1.8 times. Based on their initial experience (within first three weeks) in college, these students made a conscious and unemotional decision to terminate their education based on the belief of a mismatch between their expectations and college reality.

Self-efficacy was found to have a positive impact on college persistence (Beta = .18). With an increase of 7.5 score points on Self-Efficacy, a freshman's chance of staying in college increased by .26 times. This finding suggests that those who stayed believed that they were capable of meeting the new challenges of college even though that experience was initially received with uneasiness (Bandura, 1982).

Contrary to expectations, Empathy was negatively associated with freshman persistence

(Beta = -.04). With an increase of 25 score points on empathy, a student's chance of staying in college decreases 2.69 times. As an indication of intellectual development, Empathy reflects an individual's ability to make major decisions about life and be aware of the impact of these decisions on other people (Erwin, 1983). The present findings suggest that the dropouts may have considered the impact of their decision to withdraw on themselves as well as on others. The decision to leave did not appear to be a reckless one on the part of freshmen. It was an outcome of evaluation of one's needs in light of external reality.

Physical Fitness had a positive impact on freshman persistence (Beta = .01). With an increase of 75 score points on the Physical Fitness measure, a student's chance of staying in college increased .5 times. Since rigorous physical training constitutes a crucial component of the freshman experience at the institution, this finding was not surprising.

In conclusion, the model generated from logistic regression identified Judging, Self-Efficacy, Empathy, and Physical Fitness as significant predictors of freshman retention. The model implies that student persistence at the initial stage of college experience is affected by multiple factors from cognitive, affective, and psychomotor domains.

Content Analysis of Dropout Data

The dropouts as a group ranked the five goals for attending college in the following order of decreasing importance: perform well at college, socialize with other people, gain independence from home, make money to support self, and establish an intimate relationship with someone. It was clear that the majority of dropouts regarded doing well at college as their primary objective. Then why did they withdraw from college? The answer is partly found in the level of dissatisfaction of dropouts with different aspects of the college experience. From one third to 50% of the students expressed a certain degree of dissatisfaction with the regimented system in place at the institute; around 30% were dissatisfied with food, dormitory conditions and regulations, lack of peer support, and inadequate interaction with faculty. An overwhelming majority of the dropouts (91%) indicated dissatisfaction over the mismatch between their expectations and their experiences at the institution.

Three themes emerged from the analysis of the dropouts' responses to the open-ended questions concerning the reasons for their decision to withdraw from college: (1) cannot handle

stress, (2) mismatch between personal expectations and college reality, and (3) lack of personal commitment. The frequencies and sample responses for the three categories are summarized in Table 2. When asked about their education plans after leaving the institute, all dropouts indicated that they would transfer to anther institution or return when they felt ready.

Insert Table 2 About Here

When analyzing retention data such as these, two questions must be asked: Did the dropouts make a right decision for themselves? How can the number of dropouts be reduced through intervention programs? The answers to these questions may provide insight into student retention and lead to the development and implementation of realistic intervention strategies.

An important difference between those who left because of an inability to handle stress and those who left because of the perception of a mismatch between personal expectations and college reality is that the former mainly based their decisions on how they felt towards the new college experience ('The stress and homesickness has made me want to leave.' 'It was a lot more than I expected.' 'I was not prepared for what faced me.') while the latter considered personal needs in the context of college reality ('I prefer a more relaxed atmosphere than that of the institute.' 'I don't believe my personality and values are best suited for this environment.'). From the perspective of cognitive-developmental theories, the leavers in the latter group demonstrated a greater degree of intellectual maturation in understanding subject-object relationships (Kegan, 1979). This maturity is clearly reflected in their explanation for leaving college; if the environment in a given institution does not suit an individual's needs, personality or values, the opportunity for success may exist in a different environment. A decision to leave college based on such reasoning may prove to be a good one. As for the students who left college due to a lack of personal commitment, leaving college may be an indication of an unresolved identity crisis (Erikson, 1968). In contrast to young adults with a foreclosed status of identity, these dropouts were not content with the educational choice made by their parents (Marcia, 1980). Lacking in sufficient personal commitment, they were not motivated to cope with the new challenges of their college education.

For those students leaving because of an inability to handle stress, early intervention programs in the form of freshman counseling, peer support, and interaction with faculty may ease the initial shock of the transition to college and buffer these students from tendencies to withdraw early. As for students experiencing a mismatch between personal expectations and the college experience, appropriate intervention strategies may be to focus on pre-enrollment programs that provide information relevant to appropriate and realistic expectations. In industry these are termed realistic job previews and have proven to reduce attrition in settings outside academia but have clear implications for the collegiate environment. Finally, pre-enrollment orientation programs, career counseling, and academic advising may all prove to be crucial and necessary for those students who lack personal commitment and cannot 'get the system into their heads.' It must be understood, however, that these students need some time and space to think for themselves and to internalize a new way of functioning even as they decide what they really want versus what others want for them. This may explain why many dropouts indicated that they would either transfer to another institution or come back when they are ready.

One-Way MANOVA

Based on content analysis, the subjects were divided into four groups: persisters, leavers due to inability to handle stress, leavers due to mismatch, and leavers due to a lack of commitment. A one-way MANOVA was performed on the data with group membership as the independent variable. The dependent variables were HSGPA, SAT, Thinking, Judging, Perseverance, Self-Efficacy, Delayed Gratification, Dualism, Relativism, Commitment, Empathy, and Physical Fitness.

The multivariate analysis of variance of the data indicated significant multivariate main effects for group ($F_{(36, 966)} = 1.75$, $p < .01$). The MANOVA test for the hypotheses concerning groupwise comparisons suggested that the persister group was significantly different from the group of leavers who could not handle stress ($F_{(12, 327)} = 2.40$, $p < .01$) and the group of leavers who experienced a mismatch ($F_{(12, 327)} = 1.90$, $p < .05$). Wilk's lambda, F and p values for these tests are presented in Table 3.

Insert Table 3 About Here

The persisters scored significantly higher than the leavers who dropped out due to inability to handle stress on Perseverance ($F_{(3, 338)} = 8.81$, $p < .01$), Self-Efficacy ($F_{(3, 338)} = 4.34$, $p < .05$), and Physical Fitness ($F_{(3, 338)} = 7.89$, $p < .01$). The persisters also scored lower than this group of leavers on Dualism ($F_{(3, 338)} = 7.69$, $p < .01$) and Relativism ($F_{(3, 338)} = 7.14$, $p < .01$). These findings captured some crucial differences between the two groups in the affective and psychomotor domains. Compared to the students who persisted during the freshman year, those who dropped out due to inability to handle stress possessed less willpower to persevere in the face of difficulty, less confidence in their beliefs, actions, and ability to successfully execute tasks, relied more on external forces for guidance, and were less physically fit as measured by the PFT standards.

A slightly different pattern of characteristics emerged for the group of leavers who dropped out because of a mismatch between personal expectations and college reality. This group of leavers did not score lower than the persisters on cognitive or affective measures. In fact, they scored significantly higher than the persisters on Empathy ($F_{(3, 338)} = 4.38$, $p < .05$). Empathy is a measure of one's awareness of the impact of his or her actions on the lives of others (Erwin, 1983). Since several items measuring this construct concern career options, marriage partner, and raising a family, the present finding may imply that the persisters remained more focused than the dropouts on the pressing issue of adjusting to the new college experience rather than suffering from anticipatory anxiety regarding events that might happen down the road. Such an interpretation would give credit to the persisters for their task-oriented behavior. The finding may also suggest that the leavers in this group, while adjusting to the new college experience, did not lose sight of the broader issues outside college, and they may have considered the impact of withdrawing on themselves, their family, and the institution. From this perspective, one could dispute the notion that withdrawal from college is the result of thoughtless or haphazard behavior.

The leavers who dropped out due to a mismatch between personal expectations and college reality did score significantly lower than the persisters on Physical Fitness ($F_{(3, 338)} = 7.84$,

$p < .01$). This finding once again confirmed the notion that the standards for physical fitness set by the institution help to account for the variability associated with student retention. The results of the groupwise comparisons are presented in Table 4.

Insert Table 4 About Here

In sum, the MANOVA results warrant the following conclusions. First, significant differences were observed between persisters and dropouts on some affective and psychomotor variables but not on cognitive variables. This finding lends support to the notion that at the early stages of the freshman experience (first three weeks) precollege cognitive variables of high school GPA and SAT do not contribute significantly to the variability in student retention, nor do the cognitive traits of Thinking and Judging as measured by the MBTI. Second, when comparing the persisters with the various groups of leavers, consistent differences were found only in comparisons between the persisters and those who left because of inability to handle stress. The leavers in this group demonstrated inferior performance on several affective and psychomotor measures. Lack of determination, a lower level of self-efficacy and confidence in one's beliefs and actions, and inadequate intellectual development as reflected in thinking in absolute terms and reliance on authority figures for guidance were the primary factors causing the unsuccessful college experience for these dropouts. Third, for those students who dropped out because of a mismatch between personal expectations and college reality, no inferior performance was observed on affective measures when compared to the persisters. Their high scores on Empathy implied that their decision to withdraw from college may be the result of a careful evaluation of individual needs in relation to external reality. Withdrawal from college on such a basis should be viewed as an indication of maturity rather than an immature act.

Conclusions

The present study broadens the traditional models of college persistence by investigating student retention within the context of the cognitive, affective, and psychomotor domains. The objective of the study is three-fold: develop a prediction model for freshman retention; categorize

dropouts on the basis of reasons for withdrawal; and determine how those dropping out for specific, systematic reasons differ from persisters on cognitive, affective, and psychomotor measures. The investigation is focused on the first three weeks of the freshman experience.

Logistic regression generated a prediction model that identified Judging, Self-Efficacy, Empathy, and Physical Fitness as significant predictors of freshman retention. Self-Efficacy and Physical Fitness had a positive impact on freshman persistence whereas Judging and Empathy were negatively associated with persistent behavior. These findings suggest that leavers may have given much thought to their experiences at college, their decision to withdraw, and the possible consequences of withdrawal before they dropped out.

Three reasons were identified for freshman attrition: inability to handle stress, mismatch between personal expectations and college reality, and lack of personal commitment to a college education. As their reasons for withdrawal varied, so did their psychological preparation for college, their intellectual maturity, and their state of physical fitness. Deficiency in perseverance and self-efficacy characterized only the dropouts who could not handle the stress of college whereas for others the decision to withdraw from college manifested a degree of intellectual maturity in judging the needs of the individual in relation to an external environment.

The present study indicated that in the initial stages of the freshman experience (first three weeks), affective and psychomotor variables proved to be more useful than cognitive measures such as HSGPA and SAT in accounting for the variability associated with freshman retention. This finding suggests that psychological adjustment to the college experience (a universal issue) and meeting the demands of rigorous physical training (a demand specific to this institution) are the pressing issues for college freshmen in the first few weeks of the freshman year; academic performance looms as a major concern only as students progress further into the semester.

The present study lays the groundwork for a retention model that will be of use to institutional researchers and other personnel in higher education. The identification of variables to predict and characterize early dropouts may be used by learning-center personnel and counselors to provide early intervention strategies as well as to provide appropriate guidance to entering students. The model may also be of use to admissions personnel who wish to provide information focused on realistic expectations to prospective students.

References

Bandura, A. (1982). Self-efficacy mechanism in human agency. American Psychologist, 37, 122-147.

Bean, J. P. (1980). Dropouts and turnover. The synthesis and test of a causal model of student attrition. Research in Higher Education, 12, 155-187.

Bean, J. P. (1982). Conceptual models of student attrition: How theory can help the institutional researcher. In E. T. Pascarella. (Ed.), Studying student attrition (pp. 17-23). San Francisco: Jossey-Bass.

Bean, J. P. (1083). The application of a model of turnover in work organizations to the student attrition process. Review of Higher Education, 6, 129-148.

Brown, L. L., & Kurpius, S. E. R. (1997). Psychosocial factors influencing academic persistence of American Indian college students. Journal of College Student Development, 38(1), 3-12.

Cabrera, A. F., Castaneda, M. B., Nora, A., & Hengstler, D. (1992). The convergence between two theories of college persistence. Journal of Higher Education, 63(2), 143-164.

Cabrera, A. F., Nora, A., & Castaneda, M. B. (1993). College persistence: Structural equations modeling test of an integrated model of student retention. Journal of Higher Education, 64(2), 124-139.

Creamer, D. G. (1989). Changing internal conditions: Impact on student development. In W. L. Deegan & T. O'Banion (Eds.), Perspectives on student development (pp. 31-43). San Francisco: Jossey-Bass .

Erikson, E. H. (1968). Identify, youth and crisis. New York: Norton.

Erwin, T. D. (1983). The Scale of Intellectual Development: Measuring Perry's scheme. Journal of College Student Personnel, 24, 6-12.

Guarino, A. J., Hocevar, D, & Baker, R. L. (1997, March). Tinto's model and locus of control: Integrating two constructs. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

Hammer, A. L. & Macdaid, G. P. (1992). MBTI career report manual. Palo Alto, CA: Consulting Psychologists Press.

Hosmer, D. W., & Lemeshow, S. (1989). Applied logistic regression. New York: John Wiley & Sons, Inc.

Kegan, R. (1979). The evolving self: A process conception for ego psychology. The Counseling Psychologist, 8, 5-34.

Lawrence, G. (1993). People types & tiger stripes. Ocala, FL: Special Publications.

Marcia, J. E. (1980). Identity in adolescence. In J. Adelson (Ed.), Handbook of adolescent psychology. New York: Wiley.

Pascarella, E. T. , & Terenzini, P. T. (1980). Predicting freshman persistence and voluntary dropout decisions from a theoretical model. Journal of Higher Education, 51, 60-75.

Pascarella, E. T. , & Terenzini, P. T. (1983). Predicting voluntary freshman year persistence/withdrawal behavior in a residential university: Path analytic validation of Tinto's model. Journal of Educational Psychology, 75(2), 215-226.

Teodorescu, D. (1997, September). Modeling higher education processes with multiple logistic regression: SAS examples. Paper presented at the fifth annual conference of Southeast Sas User Group, Jacksonville, FL.

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. Review of Educational Research, 45, 89-125.

Zhang, Z. & RiCharde, R. S. (1997). College Facilitative Skills Inventory. Lexington, VA: Virginia Military Institute, Office of Institutional Research.

Zhang, Z, & RiCharde, R. S. (1998, April). Assessing College Students' Development: A repeated-measures analysis using a mixed model. Paper presented at the annual meeting of the American Educational Research Association, San Diego, CA.

Table 1. Effects of Cognitive, Affective, and Psychomotor Variables on Freshman Retention (N=462)

Variable	Beta	Wald Statistic	Odds Ratio	Overall Fit Indices
Judging	-0.08.	5.29 *	1.80	
Self-Efficacy	0.18	7.07 **	0.26	
Empathy	-0.04	8.66 **	2.69	
Physical Fitness	0.01	7.88 **	0.50	
Pseudo R^2				.29
G^2/df Ratio				.41
Chi-Square				29.19 ***

* $p < .05$ ** $p < .01$ *** $p < .001$

Table 2. Content Analysis of Reasons for Withdrawal From College (N=32)

Reason for Leaving	Frequency	Sample Responses
Cannot handle stress	6	The stress and homesickness has made me want to leave. I am leaving because I feel the commitment is too great. I cannot handle this type of environment. It was a lot more than I expected. I do not want to deal with it any more. I was not prepared for what faced me. I did not know how to interpret this type of experience.
Mismatch between personal expectations and college reality	22	This is a wonderful school, it's just not for me. The institute is not part of my plan for life. My mind can cope, but my heart does not want to be here. I prefer a more relaxed atmosphere than that of the institute. I made a quick decision on a bigger decision than I thought. I don't believe my personality and values are best suited for this environment.
Lack of personal commitment	4	I did not feel ready for college. Pushed to come to college by parents. I came to the institute for reasons other than my own. I could not seem to get the system into my head. I lacked motivation to attempt to excel.

Table 3. One-Way MANOVA: Tests of Hypotheses for the Overall and Groupwise Effects of Group (N=462)

Test	Wilk's Lambda	F Value	P Value
Overall MANOVA Test	.83	1.75	.004 **
Test for Persisters Against Leavers of Stress	.92	2.40	.006 **
Test for Persisters Against Leavers of Mismatch	.93	1.90	.033 *
Test for Persisters Against Leavers of No Commitment	.96	1.05	.41

* p < .05 ** p < .01 *** p < .001

Table 4. One-Way MANOVA: Follow-up Comparisons of Means on Cognitive, Affective, and Psychomotor Measures (N=462)

	Persisters (P) vs. Leavers of Stress (S)			Persisters (P) vs. Leavers of Mismatch (M)		
Variable	Mean of P	Mean of S	F Value	Mean of P	Mean of M	F Value
HSGPA	3.08	2.75	2.88	3.08	3.25	2.50
SAT	1113.11	1027.50	2.00	1113.11	1122.78	.66
Thinking	14.28	9.67	.39	14.28	13.48	.01
Judging	14.97	17.33	1.00	14.97	18.00	2.17
Perseverance	32.28	23.50	8.81 **	32.28	31.76	.23
Self-Efficacy	24.79	21.00	4.34 *	24.79	23.81	2.68
Delayed Gratification	2.45	2.00	.89	2.45	2.24	.11
Dualism	72.11	87.00	7.69 **	72.11	77.32	1.17
Relativism	43.74	57.50	7.14 **	43.74	45.73	.15
Commitment	109.41	106.17	.41	109.41	117.18	2.80
Empathy	61.64	66.67	3.02	61.64	74.41	4.38 *
Physical Fitness	146.84	90.50	7.89 **	146.84	99.73	7.84 **

* p < .05 ** p < .01 *** p < .001